

5.3 & 5.4 Solving Triangles

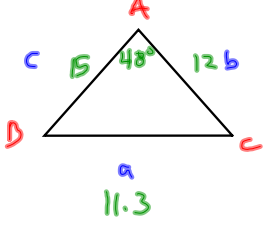
Steps

1) Draw Triangle

2) Solve for all unknowns;

- 90 Degrees use SOH CAH TOA
- Non-Right Triangles
  - Matching Pair- Sine Law
  - No Matching Pair- Cosine Law

i.e. Solve Triangle ABC, given A= 48 degrees, c = 15m and b = 12m



Apr 9-8:17 AM

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$$a^2 = b^2 + c^2 - 2bc \cos A$$
$$a^2 = 12^2 + 15^2 - 2(12)(15) \cos 48^\circ$$
$$a^2 = 144 + 225 - 360(0.6691)$$
$$a^2 = 369 - 240.9$$
$$a^2 = 128.1$$
$$a = 11.3$$

Apr 9-8:17 AM


$$\frac{\sin A}{a} = \frac{\sin C}{c}$$
$$\frac{\sin 48^\circ}{11.3} = \frac{\sin C}{15}$$
$$11.3 \sin C = \sin 48^\circ (15)$$
$$\sin C = \frac{\sin 48^\circ (15)}{11.3}$$
$$\sin C = \frac{0.7421(15)}{11.3}$$
$$\sin C = 0.7892$$
$$C = \sin^{-1}(0.7892)$$
$$C = 52^\circ$$


$\angle C = 180^\circ - (48^\circ + 52^\circ)$   
 $\angle C = 180^\circ - (100^\circ)$   
 $\angle C = 80^\circ$   
(Sum of angles)

Apr 9-10:05 AM


$$a^2 = b^2 + c^2 - 2bc \cos A$$
$$11.3^2 = 12^2 + 15^2 - 2(12)(15) \cos A$$
$$127.7 = 144 + 225 - (360) \cos A$$
$$127.7 = 369 - 360(\cos A)$$
$$127.7 - 369 = -360(\cos A)$$
$$-241.3 = -360 \cos A$$
$$\frac{-241.3}{-360} = \cos A$$
$$(0.6705) = \cos A$$
$$\cos^{-1}(0.6705) = A$$



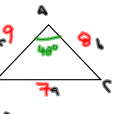
Oct 31-10:11 AM

p. 300 q. 9

p.309 q 5,6, & 7

Apr 9-10:12 AM

Sine Law

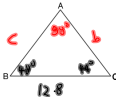

$$\frac{\sin A}{a} = \frac{\sin C}{c}$$
$$\frac{\sin 48^\circ}{a} = \frac{\sin C}{15}$$
$$15 \sin 48^\circ = a \sin C$$
$$15(0.7421) = a \sin C$$
$$11.1315 = a \sin C$$
$$11.1315 = 144 \cos A$$
$$-96 = -144 \cos A$$
$$\frac{-96}{-144} = \cos A$$
$$(0.6667) = \cos A$$
$$\cos^{-1}(0.6667) = A$$
$$48^\circ = A$$


Apr 9-10:21 AM

Ryan is building a house and he needs to know information about the roof's design. The base of the roof is 12.8m wide and the rafters form angles of 48 degrees and 44 degrees to the horizontal. How long to the nearest tenth of a meter is each rafter?

Nov 16-10:02 AM

Ryan is building a house and he needs to know information about the roof's design. The base of the roof is 12.8m wide and the rafters form angles of 48 degrees and 44 degrees to the horizontal. How long to the nearest tenth of a meter is each rafter?

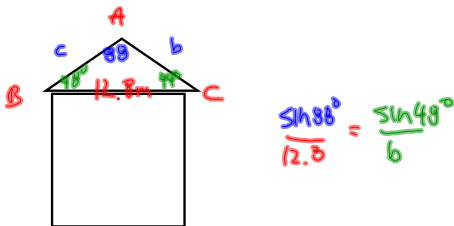


$180 - (48 + 44) = 88^\circ$   
 $180 - (92) = 88^\circ$   
(sum of int Δ)

$$\frac{\sin 48^\circ}{12.8} = \frac{\sin 44^\circ}{b} \quad b = 9.5$$
$$\frac{\sin 48^\circ}{12.8} = \frac{\sin 44^\circ}{c} \quad c = 8.9$$
$$\sin 48^\circ (c) = \sin 44^\circ (12.8)$$
$$c = \frac{\sin 44^\circ (12.8)}{\sin 48^\circ}$$
$$c = \frac{(0.6946)(12.8)}{0.9914}$$
$$= 8.9$$

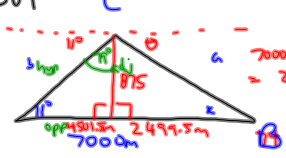
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Nov 16-10:02 AM

#7  
P 309



$180 - (48 + 44) = 88^\circ$   
 $180 - (92) = 88^\circ$   
(sum of int Δ)

Top

$$\tan 79^\circ = \frac{0}{8.75}$$
$$8.75 \tan 79^\circ = 0$$
$$8.75 (5.1446) = 0$$
$$4501.5m = 0$$
$$\tan x = \frac{0}{2499.5}$$
$$\tan x = \frac{8.75}{2499.5}$$
$$\tan x = (0.3502)$$
$$x = \tan^{-1}(0.3502)$$
$$= 19^\circ$$

Nov 7-10:15 AM